

(496)

SFUND RECORDS CTR
2331469

***** CONFIDENTIAL *****
***** PRE-DECISIONAL DOCUMENT *****

SUMMARY SCORESHEET FOR COMPUTING

PROPOSED REVISED HRS SCORE

SITE NAME: Cosden Oil and Chemical Company
(currently occupied by Nursery Supplies, Inc.)

CITY, COUNTY: Orange, Orange County

EPA ID #: CAD000097634

PROGRAM ACCOUNT #: FCA1288SAA

EVALUATOR: Cathy Cauz

DATE: 03/09/90

THIS SCORESHEET IS FOR A PA _____ SSI X LSI _____

PROJECTED PROPOSED REVISED HRS SCORE

	S pathway	S ² pathway
Air Migration Pathway Score (S _a)	0	0
Groundwater Migration Pathway Score (S _{gw})	25.83	667.19
Surface Water Migration Pathway Score (S _{sw})	3.15	9.92
On-site Exposure Pathway Score (S _{os})	0	0
$S_a^2 + S_{gw}^2 + S_{sw}^2 + S_{os}^2$		677.11
$(S_a^2 + S_{gw}^2 + S_{sw}^2 + S_{os}^2)/4$		169.28
$\sqrt{(S_a^2 + S_{gw}^2 + S_{sw}^2 + S_{os}^2)/4}$		13.01

AIR MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

<u>Likelihood of Release</u>	<u>Maximum Value</u>	<u>Projected Score</u>	<u>Ref.</u>	<u>Conf.</u>
1. Observed Release	450	_____	_____	_____
2. Potential to Release* (Highest value assigned to any source evaluated)	390	_____	_____	_____
3. Likelihood of Release (Higher of Lines 1 or 2)	450	_____	_____	_____
<u>Waste Characteristics</u>				
4. Toxicity/Mobility	100	_____	_____	_____
5. Hazardous Waste Quantity	100	_____	_____	_____
6. Waste Characteristics (Lines 4+5)	200	0	2,11	H
<u>Targets</u>				
7. Maximally Exposed Individual	50	_____	_____	_____
8. Population*	235	_____	_____	_____
9. Land Use*	10	_____	_____	_____
10. Sensitive Environments*	100	_____	_____	_____
11. Targets (Lines 7+8+9+10, subject to a maximum of 235)	235	_____	_____	_____
<u>Air Pathway Migration Score</u>				
12. Pathway Score (S_a)	5			
(Lines 3x6x11)/2.115X10	100	0	**	

*Use additional tables.

** S_a is not to be rounded to the nearest integer.

*At^a the present time, there is no hazardous material/waste on site that poses a threat to the air (2,11).

AIR PATHWAY CALCULATIONS

2. Potential to Release

Source	Source Type	Source Type Factor Value (Table 2-6)	Source Mobility Factor Value (Table 2-10)	Sum	Source Contain. Value (Tables 2-4,2-5)	Emission Source Value
		(A)	(B)	(A + B)	(C)	(A+B) x C
1.	>	>	>	>	>	>
2.	>	>	>	>	>	>
3.	>	>	>	>	>	>
4.	>	>	>	>	>	>
Reference: >						

8. Population

Distance Category	Distance (miles)	(A) Population	(B) Distance Weight	(A x B)
1	on-site	>	5.265	>
2	> 0 to 1/4	>	1.0	>
3	>1/4 to 1/2	>	0.1751	>
4	>1/2 to 1	>	0.0517	>
5	> 1 to 2	>	0.0171	>
6	> 2 to 3	>	0.0083	>
7	> 3 to 4	>	0.0054	>
Air target populations = $\frac{(\text{Sum of } A \times B)}{100} = >$				
Sum of (A x B)				>
Reference: >				

AIR PATHWAY CALCULATIONS (Cont.)

9. Land Use

Land Use	Distance (miles)	(A) Distance Weight (Table 2-16)	(B) Value For Use Type	(A x B)
Commercial/Industrial/ Institutional	>	>	5	>
Single Family Residential	>	>	8	>
Multiple Family Residential	>	>	10	>
Parks	>	>	5	>
Prime Agricultural	>	>	7	>
Nonprime Agricultural	>	>	5	>
Sum of (A x B)				>

Land use factor value = Sum of (A X B) Subject to maximum value of 10 = >

Reference: >

10. Sensitive Environments

Type of Environment	(A) Assigned Value (Table 2-18)	Distance (miles)	(B) Distance Weight (Table 2-16)	(A x B)
>	>	>	>	>
>	>	>	>	>
>	>	>	>	>
>	>	>	>	>
>	>	>	>	>
Sum of (A x B)				>
Sensitive environment factor value = Sum of (A x B) =				>
				10

Reference: >

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GROUNDWATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

	<u>Likelihood of Release</u>	<u>Maximum Value</u>	<u>Projected Score</u>	<u>Ref.</u>	<u>Conf.</u>
1.	Observed Release	500	0		
2.	Potential to Release*			8,9,14,	
2a.	Containment	10	10	15,16,27	H
2b.	Net Precipitation	10	1	30	H
2c.	Depth to Aquifer/ Hydraulic Conductivity	35	35	12,26,	E
2d.	Sorptive Capacity	5	5	30,32	E
2e.	Potential to Release (Lines 2a+(2b+2c+2d))	500	410		
3.	Likelihood of Release (Higher of Lines 1 or 2e)	500	410		
<u>Waste Characteristics</u>					
4.	Toxicity/Mobility	100	53	5	E
5.	Hazardous Waste Quantity	100	10		D
6.	Waste Characteristics (Lines 4+5)	200	63		
<u>Targets</u>					
7.	Maximally Exposed Individual	50	50	31,32	E
8.	Population*				
8a.	Level I Concentrations	200	0		
8b.	Level II Concentrations	200	0		
8c.	Level III Concentrations	200	0		
8d.	Potential Contamination*	200	200	31,32	E
8e.	Population (Lines 8a+ 8b+8c+8d, subject to a maximum of 200)	200	200		
9.	Groundwater Use				
9a.	Drinking Water Use	50	50	31	H
9b.	Other Water Use	20			
9c.	Groundwater Use (Lines 9a+9b, with a maximum of 50)	50	50		H
10.	Wellhead Protection Area	50	0		
11.	Targets (Lines 7+8e+9c+10, subject to a maximum of 200)	200	200		

GROUNDWATER MIGRATION PATHWAY SCORESHEET (CONCLUDED)

Factor Categories and Factors

<u>Likelihood of Release</u>	<u>Maximum Value</u>	<u>Projected Score</u>	<u>Ref.</u>	<u>Conf.</u>
12. Aquifer Score [Lines 3x6x11)/2x10 ⁵]**	100	25.83		
<u>Groundwater Migration Pathway Score</u>				
13. Pathway Score (Sgw), (Highest Value from Line 12 for all aquifers evaluated)	100	25.83	**	

* Use additional tables

** These scores are not to be rounded to the nearest integer.

GROUNDWATER PATHWAY CALCULATIONS

2. Potential to Release

Layer Description	(T) Thickness(ft)	(HC) Hydraulic Conductivity (cm/sec)	(SC) Sorptive Capacity	(T/HC)	(TxSC)
gravel	70'	10^{-2}	3	7,000	210
>	>	>	>	>	>
>	>	>	>	>	>
>	>	>	>	>	>
Sum(T) <u>70'</u>				Sum(T/HC) = <u>7,000</u>	Sum(TxSC) = <u>210</u>

$$\text{Depth to Aquifer/Hydraulic Conductivity} = \frac{\text{Sum(T)}}{\text{Sum(T/HC)}} = 10^{-2}$$

$$\text{Sorptive Capacity} = \frac{\text{Sum(T x SC)}}{100} = 2.1$$

Reference: 12,26,30,32

8. Population

Actual Contamination

Well Identifier	Contaminant Detected	Concentration	Benchmark	(A) Population	(B) Level* Divisor	(A/B)
>	>	>	>	>	>	>
>	>	>	>	>	>	>
>	>	>	>	>	>	>
Sum (A/B) Level I						>
Sum (A/B) Level II						>
Sum (A/B) Level III						>

* Divisors

- Level I = 1
- Level II = 10
- Level III = 100

Reference: >

GROUNDWATER PATHWAY CALCULATIONS (Cont.)

8. Population

Potential Contamination

Dilution Weighting Factor (DW)

Distance (miles)	Karst	All Others	(P) Population	(DW x P)
0 to 1/4	1.00	1.00	0	0
>1/4 to 1/2	0.62	0.62	0	0
>1/2 to 1	0.50	0.32	100,000	32,000
> 1 to 2	0.50	0.18	0	0
> 2 to 3	0.50	0.13	0	0
> 3 to 4	0.50	0.08	0	0
Sum (DW x P)				32,000

$$\text{Potential contamination} = \frac{\text{Sum(DW x P)}}{100} = 320$$

Reference: 31, 32

SURFACE WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value	Projected Score	Ref.	Conf.
<u>DRINKING WATER THREAT</u>				
<u>Likelihood of Release</u>				
1. Observed Release	120	120*	17	E/H
2. Potential to Release by Overland Flow				
2a. Containment	10	10	17	H
2b. Runoff	6	4	1	E
2c. Distance to Surface Water	6	3	1	E
2d. Potential to Release by Overland Flow (Lines 2ax(2b+2c))	120	70		
3. Potential to Release by Flood				
3a. Containment (Flood)	10			
3b. Flood Frequency	12	0	34	H
3c. Potential to Release by flood (Lines 3ax3b)	120	0		
4. Potential to Release (Lines 2d+3c, subject to a maximum of 120)	120	70		
5. Likelihood of Release (Higher of Lines 1 or 4)	120	120		
<u>Waste Characteristics</u>				
6. Toxicity/Persistence	100	53	5	E
7. Hazardous Waste Quantity	100	10		D
8. Waste Characteristics (Lines 6+7)	200	63		
<u>Targets</u>				
9. Maximally Exposed Individual	50	0		
10. Population*				
10a. Level I Concentrations	200	0		
10b. Level II Concentrations	200	0		
10c. Level III Concentrations	200	0		
10d. Potential Contamination	200	0	33,34	H
10e. Population (Lines 10a + 10b+10c+10d, subject to a maximum of 200)	200	0		
2b. rainfall: 2.5"				
runoff curve #: 70				
drainage area: 1				

SURFACE WATER MIGRATION PATHWAY SCORESHEET (CONTINUED)

Factor Categories and Factors	Maximum Value	Projected Score	Ref.	Conf.
DRINKING WATER THREAT (CONCLUDED)				
<u>Targets (Concluded)</u>				
11. Surface Water				
11a. Drinking Water Use	50	0		
11b. Other Water Use	20	20	33,34	H
11c. Surface Water Use (Lines 11a+11b)	50	20		
12. Targets (Lines 9+10e+11c, subject to a maximum of 200)	200	20		
<u>Drinking Water Threat Score</u>				
13. Drinking Water Threat (Lines 5x8x12)	4.8x10 ⁶	151,200		
HUMAN FOOD CHAIN THREAT				
<u>Likelihood of Release</u>				
14. Likelihood of Release (Same Value as Line 5)	120	120	17	H
<u>Waste Characteristics</u>				
15. Toxicity/Persistence	100	53	5	E
16. Hazardous Waste Quantity	100	10		D
17. Waste Characteristics (Lines 15+16)	200	63		
<u>Targets</u>				
18. Population*				
18a. Potential Human Food Chain Contamination	200	0	33,34	H
18b. Actual Human Food Chain Contamination	200	0		
18c. Population (Lines 18a+18b, subject to a maximum of 200)	200	0		
19. Fishery Use	50	0	33,34	H
20. Targets (Lines 18c+19, subject to a maximum of 200)	200	0		

SURFACE WATER MIGRATION PATHWAY SCORESHEET (CONTINUED)

<u>Factor Categories and Factors</u>	<u>Maximum Value</u>	<u>Projected Score</u>	<u>Ref.</u>	<u>Conf.</u>
HUMAN FOOD CHAIN THREAT (Concluded)				
<u>Human Food Chain Threat Score</u>				
21. Human Food Chain Threat (Lines 14x17x20)	4.8x10 ⁶	0		
HUMAN RECREATION THREAT				
<u>Likelihood of Release</u>				
22. Likelihood of Release (Same value as Line 5)	120	120	17	H
<u>Waste Characteristics</u>				
23. Toxicity/Persistence	100	53	5	E
24. Hazardous Waste Quantity	100	10		D
25. Waste Characteristics (Lines 23+24)	200	63		
<u>Targets</u>				
26. Population*				
26a. Actual Contamination (Highest value assigned to any recreation area, subject to a maximum of 200)	200	0		
26b. Potential Contamination (Highest value assigned any recreation area, subject to a maximum of 200)	200	0	33	H
26c. Population (Higher of values on Lines 26a or 26b)	200	0		
27. Targets (Value for Line 26c)	200	0		
<u>Human Recreation Threat Score</u>				
28. Human Recreation Threat (Lines 22x25x27)	4.8x10 ⁶	0		

SURFACE WATER MIGRATION PATHWAY SCORESHEET (CONTINUED)

Factor Categories and Factors	Maximum Value	Projected Score	Ref.	Conf.
ENVIRONMENTAL THREAT				
29. Likelihood of Release (Same Value as Line 5)	120	120	17	H
<u>Waste Characteristics</u>				
30. Ecosystem Toxicity/Persistence	100	43	5	E
31. Hazardous Waste Quantity	100	10		D
32. Waste Characteristics (Lines 30+31)	200	53		
<u>Targets</u>				
33. Sensitive Environments*				
33a. Level I Concentrations	120	0		
33b. Level II Concentrations	120	0		
33c. Potential Contamination	120	0	37	E
33d. Sensitive Environments subject to a maximum of 120)	120	0		
34. Targets (Value from Line 33)	120	0		
<u>Environmental Threat Score</u>				
35. Environmental Threat (Lines 29x32x34)	2.88x10 ⁶	0		

SURFACE WATER MIGRATION PATHWAY SCORE FOR A WATERSHED

36. Watershed Score	100	3.15	**	
[(Lines 13+21+28+35)/48,000 subject to a maximum of 100]				

SURFACE WATER MIGRATION PATHWAY SCORE

37. Pathway Score (Sgw), (Sum of scores from Line 36 for all watersheds evaluated, subject to a maximum of 100)	100	3.15	**	
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* Use additional tables.

** These scores are not to be rounded to the nearest integer.

SURFACE WATER PATHWAY CALCULATIONS

10. Drinking Water Targets

Actual Contamination

Intake	Contaminant Detected	Concentration	Benchmark	(A) Population	(B) Level* Divisor	(A/B)
>	>	>	>	>	>	>
>	>	>	>	>	>	>
>	>	>	>	>	>	>
>	>	>	>	>	>	>
Sum (A/B) Level I						>
Sum (A/B) Level II						>
Sum (A/B) Level III						>

* Divisors

- Level I = 1
- Level II = 10
- Level III = 100

Reference: >

Potential Contamination

Intake	Average Stream Flow	(DW) Dilution Factor (Table 4-11)	(P) Population Served	(DW x P)
>	>	>	>	>
>	>	>	>	>
>	>	>	>	>
>	>	>	>	>
Sum (DW x P)				>

Potential contamination = $\frac{\text{Sum(DW x P)}}{100}$ = >

Reference: >

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SURFACE WATER CALCULATIONS (Cont.)

18. Food Chain Targets

Fishery	Production (lb/yr)	Assigned Production Value (Table4-15)	Bioaccumulation Factor Value	(P)	Average Stream Flow at Fishery	(DW)	(PxDW)
				Assigned Population Value (Table4-16)		Dilution Weighting Factor (Table4-11)	
>	>	>	>	>	>	>	>
>	>	>	>	>	>	>	>
>	>	>	>	>	>	>	>
>	>	>	>	>	>	>	>
>	>	>	>	>	>	>	>
Sum (P)				>	Sum (PxDW)		>

For fisheries with Actual Contamination, Food Chain Targets = Sum (P) = >

For fisheries with Potential Contamination, Food Chain Targets = $\frac{\text{Sum}(\text{DW} \times \text{P})}{100}$ = >

Reference: >

SURFACE WATER CALCULATIONS (Cont.)

26. Human Recreation Targets

Recreation Area: > _____

Accessibility/Attractiveness Factor (AAF) Value: > _____

Distance limit: > _____

Distance (miles)	(A) Multiplier (Table 4-20)	(P) Population	(A x P)
0 to <5	> _____	> _____	> _____
5 to <10	> _____	> _____	> _____
10 to <20	> _____	> _____	> _____
20 to <40	> _____	> _____	> _____
40 to <60	> _____	> _____	> _____
60 to <80	> _____	> _____	> _____
80 to <100	> _____	> _____	> _____
100 to <125	> _____	> _____	> _____
Sum (A x P)			> _____

A) Recreation use population value (RU) = (AAF) x Sum (A x P) = > _____

B) Assign RU value from Table 4-21: > _____

C) Dose adjusting factor: > _____

D) Assign Human Recreation population value from Table 4-22: > _____

E) Actual Human Recreation Target Population = (value from 26.D) x (0.10) = > _____

F) Potential Human Recreation Target Population =
(value from 26.D) x (Dilution weighting factor)/100 = > _____

Reference: > _____

SURFACE WATER CALCULATIONS (Cont.)

33. Environmental Targets

Actual Contamination

Sensitive Environment	(A) Assigned Value (Table 2-18 or 2-19)	(B) Level Multiplier*	(A x B)
>	>	>	>
>	>	>	>
Sum (A x B) Level I			>
Sum (A x B) Level II			>

- * Multipliers
- Level I = 10
 - Level II = 1

Reference: >

Potential Contamination

Sensitive Environment	(A) Assigned Value (Table 2-18 or 2-19)	Average Stream Flow (cfs)	(DW) Dilution Weighting Factor (Table 4-11)	(A x DW)
>	>	>	>	>
>	>	>	>	>
>	>	>	>	>
Sum of (A x DW)				>

Potential contamination = $\frac{\text{Sum (A x DW)}}{10} = >$

Reference: >

ON-SITE EXPOSURE PATHWAY SCORESHEET

Factor Categories and Factors

<u>Resident Population Threat</u>	<u>Maximum Value</u>	<u>Projected Score</u>	<u>Ref.</u>	<u>Conf.</u>
1. Likelihood of Exposure	100	0		
2. Waste Characteristics	5			
3. Targets				
3a. High-Risk Population	100			
3b. Total Resident Population	100			
3c. Terrestrial Sensitive Environments	25			
3d. Targets (Lines 3a+3b+3c, subject to a maximum of 100)	100			
4. Resident Population Threat Score (Lines 1x2x3d)	50,000	0		
<u>Nearby Population Threat</u>				
5. Likelihood of Exposure				
5a. Waste Quantity	100	0		
5b. Accessibility Frequency of Use	100			
5c. Likelihood of Exposure	100	0		
6. Waste Characteristics	5			
7. Targets*				
7a. Population Within 1-Mile	100			
7b. Targets (Line 7a, subject to a maximum of 100)	100			
8. Nearby Population Threat Score (Lines 5cx6x7)	50,000	0		
<u>On-site Exposure Pathway Score</u>				
9. On-site Exposure Pathway Score (SOS) (Lines [4+8]/500, to a maximum of 100)	100	0	**	

* Use additional table.

**These scores are not to be rounded to the nearest integer.

All on site soil contamination has been cleaned up. This remediation was approved and closed by Orange County health Department (13,2,11).

ON-SITE EXPOSURE CALCULATIONS

7. Nearby Population Targets

Distance (miles)	(A) Multiplier	(P) Population	(A x P)
0 to 1/4	0.10	>	>
>1/4 to 1/2	0.05	>	>
>1/2 to 1	0.025	>	>
Sum (A x P)			>

Reference: >

8. REFERENCES

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RATIONALE FOR COSDEN OIL AND CHEMICAL COMPANY

Air Migration Pathway:

There is no known hazardous waste/material on-site currently available to the air. Nursery Supplies' current operations do not involve any hazardous materials. Solid polyethylene pellets are used to form plastic containers and no liquid chemicals are involved. All known soil contamination at the site has been remediated. This remedial work was approved by Orange County Health Care Agency.

Groundwater Migration Pathway:

The groundwater pathway was scored assuming that some contamination may still lie deep in the soils due to the two tank spill incidents. The likelihood of this assumption seems low though because of the remediation efforts performed by Nursery Supplies. There is no containment of any remaining soil contamination. Depth to Aquifer/Hydraulic Conductivity and Sorptive Capacity were evaluated given the well log of the City of Orange well at Main and Katella.

Toxicity/mobility were evaluated for ethyl benzene and styrene monomer. Evaluating waste quantity using the volume or area of excavated soil results in a waste quantity value of less than 1. Thus, the default value of 10 was used for waste quantity value.

Maximally exposed individual was evaluated using the City of Orange well on Struck Avenue. Although this well is screened at a deeper depth than the well at Main and Katella, an aquitard does not appear to exist between these two depths.

Surface Water Migration Pathway:

During the 1982 incident, an unknown quantity of fire department runoff water was released to the flood control channels. The quantity was reportedly small but this cannot be verified. This runoff water may have contained spilled styrene monomer. The likelihood of release was given a value of 120 for observed release.

Again for toxicity/persistence, ethyl benzene and styrene monomer were evaluated. A default value of 10 was used for waste quantity.

The flood control channels release to the Santa Ana River. While the Santa Ana River is not used for drinking water, Other Water Use was given a value of 20 in the case that the water has some other beneficial use. There are no known fisheries, recreational facilities, or endangered species habitat along the Santa Ana River.

On-site Exposure Pathway:

There is not potential for on-site exposure. All on-site soil contamination has been remediated by Nursery Supplies and approved by Orange County Health Care Agency.